

DATA ASSIMILATION AND MODEL EVALUATION EXPERIMENTS (DAMEE DATA)

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LONG-TERM GOALS

The long-term goal is to contribute to the development of a global ocean nowcasting capability with basin-wide forecasting skill that provides a description of the three dimensional ocean structure, the locations of mesoscale features such as eddies and ocean fronts, and environmental definition with an accuracy superior to climatology and persistence.

OBJECTIVES

Provide an unbiased environment in which the nowcast/forecast capabilities of numerical ocean models can be evaluated, keeping current with ongoing field experiments to assess the usefulness and possible impact of data, as it becomes available.

Focus on data acquisition, quality control, analysis and processing. Each contributing part of the desired end data product will deliver to a common point (USM) for final assemblage, analysis, and distribution.

Perform an unbiased comparison between Model output and Measured data as defined by a consensus reached in the DAMEE Information Exchange Meeting #4 for the Standard , High resolution and Data Assimilation experiments.

Execute an information management component which provides an interactive forum and coordination point for all the participating groups.

APPROACH

Bathymetric charts were used to digitize the 0m, 20m, 100m and 1000m isolines as well as point measurements around the Caribbean Islands and the South American and North American coasts . These data were interpolated to a 1/24 degrees grid and incorporated into the DAMEE bathymetric master data set.

Three modeling groups (MOM, POM and MICOM) submitted model output of temperature and salinity along cross sections at 27N and 55W and between Cape Hatteras and Bermuda. These data were compared to climatology.

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WORK COMPLETED

An improved Bathymetric data set (master_2.5_05) was created. This data set is more accurate in the Caribbean Sea. Fig. 1 shows a comparison between the new bathymetry and the previous one for the region around the “Tongue of the Ocean”.

A comparison between coarse resolution model run output and climatology was completed. Fig. 2 shows the difference between model output and climatology along a cross section at 27N for depths 0-1000m. Fig. 3 shows the difference between model output and climatology along a cross section at 55W for depths 0-5500m.

The fourth DAMEE-NAB Information Exchange Meeting (IEM#4) was held at the Institute of Marine Sciences, USM, Stennis Space Center, Mississippi, 24-26 March 1997.

<http://www.coam.usm.edu/damee/index.html>

RESULTS

There has been a significant improvement made in the bathymetry data base for the North Atlantic in the Caribbean (Fig. 1) and is available to the community.

Consistent, comprehensive, multi-parameter analysis is demonstrated and reveals the importance of temperature and salinity variations in density driven currents in models. (Figs. 2 and 3).

IMPACT/APPLICATIONS

This project is developing a comprehensive data archive of the bathymetry and mesoscale circulation of the North Atlantic that has been very carefully quality controlled. This data archive is a resource not only for the ocean modeling community but also for the Navy for initializing and verification of numerical ocean models

TRANSITIONS

The data archive is presently available to the ocean community at the DAMEE web site. It is actively used by all DAMEE participants. An improved bathymetry is now available. Its use in model runs may enhance model performance.

RELATED PROJECTS

In addition to the DAMEE (DATA) group, participating modeling groups are from NRL/SSC, University of Miami, UCLA, Rutgers, Princeton, MIT, and Mississippi State University.

REFERENCES

The new bathymetry is available as:

ftp://www.coam.usm.edu/pub/damee/data/Bathymetry/Damee/master_2.5_05.gz

The plots of the coarse resolution model outputs and their comparison with climatology are available in directory:

<ftp://www.coam.usm.edu/pub/damee/data/Plots>

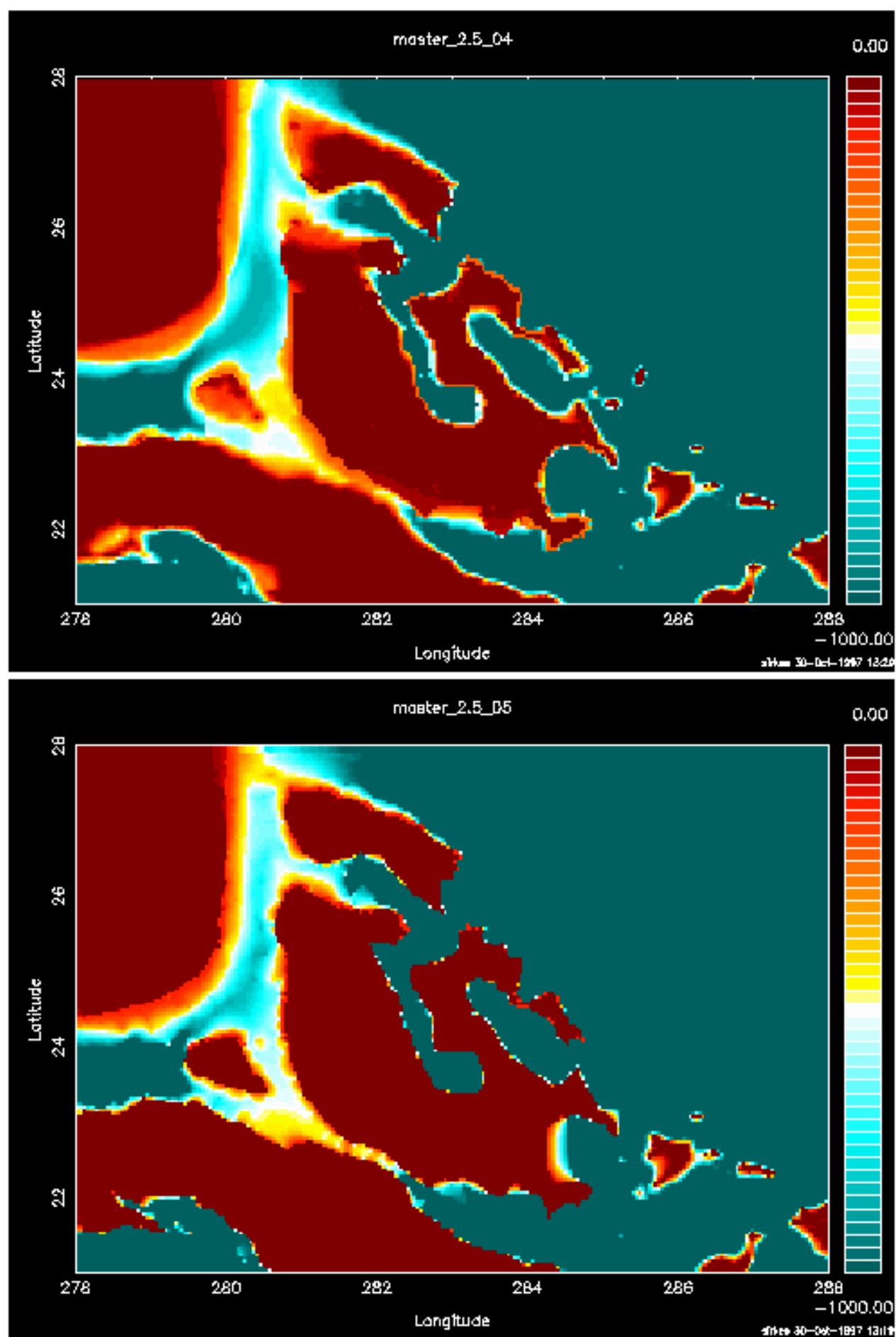


Fig. 1

Fig. 2

Cross Section at 27N

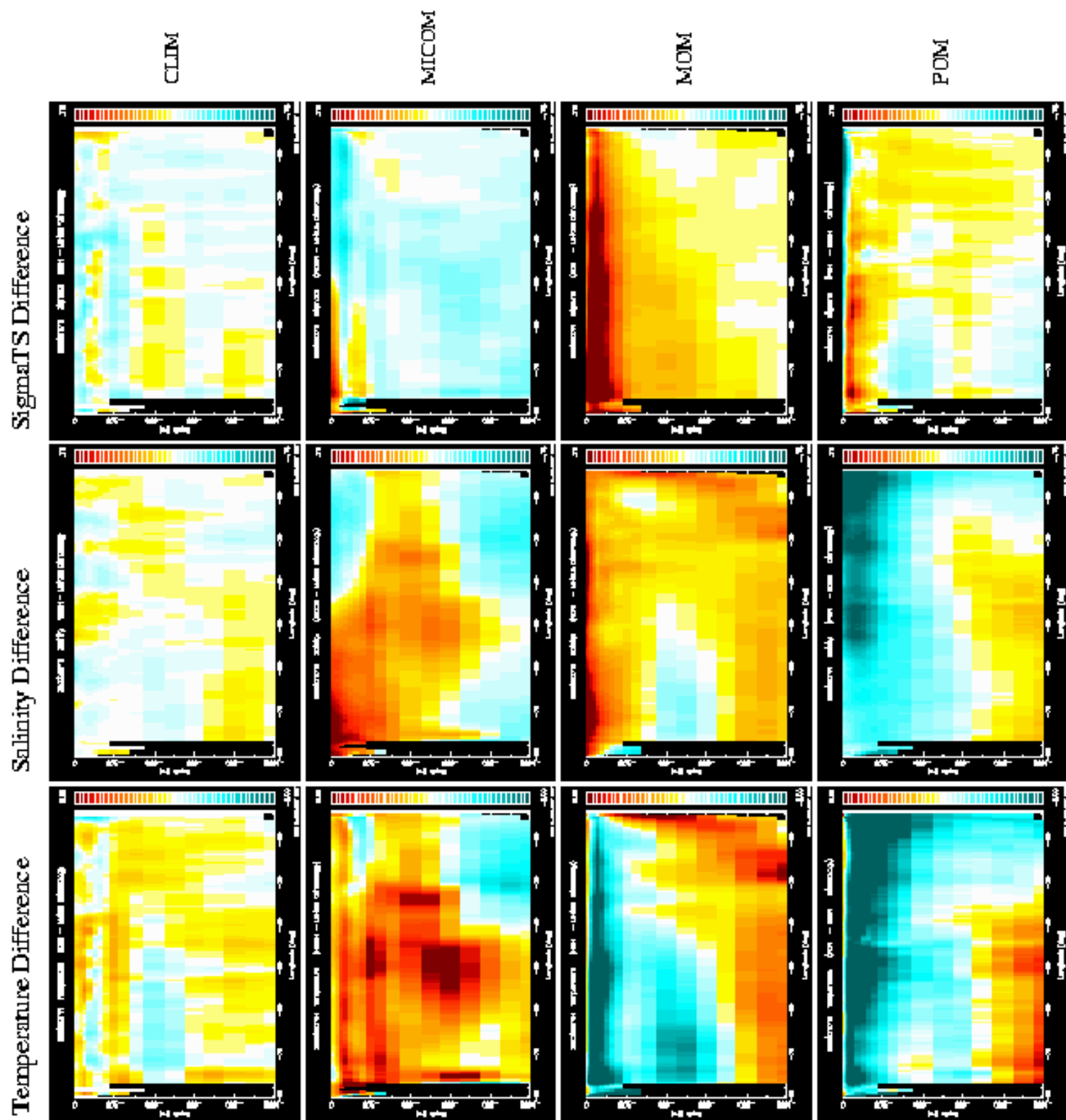


Fig. 3

Cross Section at 55W

